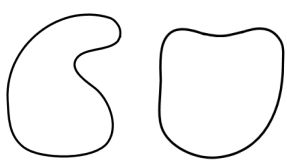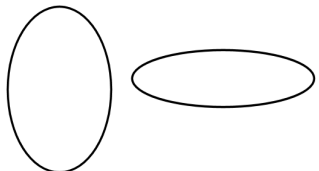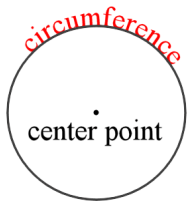# Circles

| These figures are round, but they are not circles. | | These are ovals. They are symmetric and round, but they are still not circles. Why not?

What makes a circle? | |

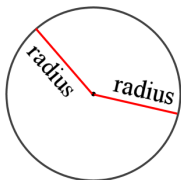The difference between other round figures and circles is this:

In a circle, the <u>distance</u> from the **center point** to the actual circle line, or **circumference of the circle**, remains the same.
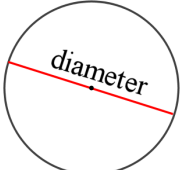
This distance is called the **radius** of the circle.

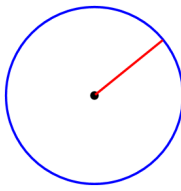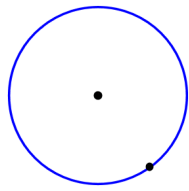In other words, all the points on the circumference are AT THE SAME DISTANCE from the center point.
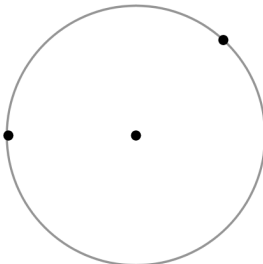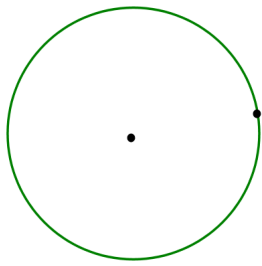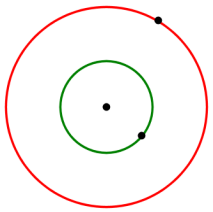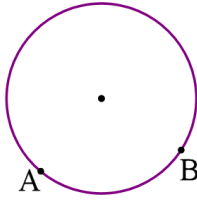

| This distance from the center point to any point on the circumference is called the **radius**. | | A line through the center point is called a **diameter**. | |

1. Draw a radius or a diameter from the given point. Use a ruler. Look at the example.

Here, a radius is drawn from the given point.

a. Draw a radius from the given point.

b. Draw a radius from each of the given points.

c. Draw a diameter from the given point.

d. Draw a diameter for the smaller circle and a diameter for the bigger circle from the given points.

e. Draw a radius from the point A and a diameter from the point B.

2. Learn to use a compass to draw circles.

   a. Draw many circles with the compass.

   **b.** Now, set the radius on the compass to be 3 cm, and draw a circle.
   You can do that by placing the compass next to a ruler, and adjusting
   the radius of the compass until it is 3 cm as measured by the ruler.
   Some compasses show the radius for you, so you won't need a ruler.

   c. Draw a circle with a radius of 5 cm.

   d. Draw a circle with a radius of 1 ½ in.
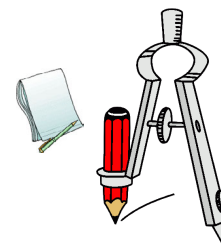
3. **a.** Draw two diagonals into this square. Draw a point
   where they cross (the center point of the square).
   Now, erase the lines you drew, leaving the point.

   b. Draw a circle *around* the square so that it touches
   the vertices of the square. Use the point you drew
   in (a) as the center point.

   c. Fill in: The _____ of the circle
   has the same length as the diagonal of the square.
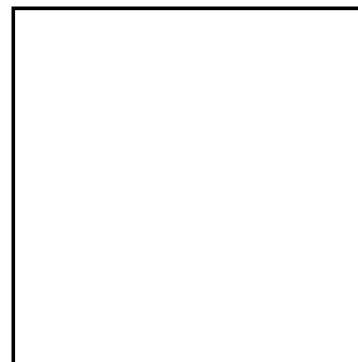
4. **a.** Draw a circle *inside* this square so that it touches
   the sides of the square but will not cross over them.

   b. Fill in: The _____ of the square
   has the same length as the diameter of the circle.

   *You can repeat or practice exercises #3 and #4 in
   your notebook.*

5. **a.** Draw a circle with center point (5, 6)
   and a radius of 2 units. Use a compass.

   b. Draw another circle with the same center
   point, but double the radius.

Sample worksheet from
www.mathmammoth.com
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Math Mammoth Geometry 1 (Blue Series)
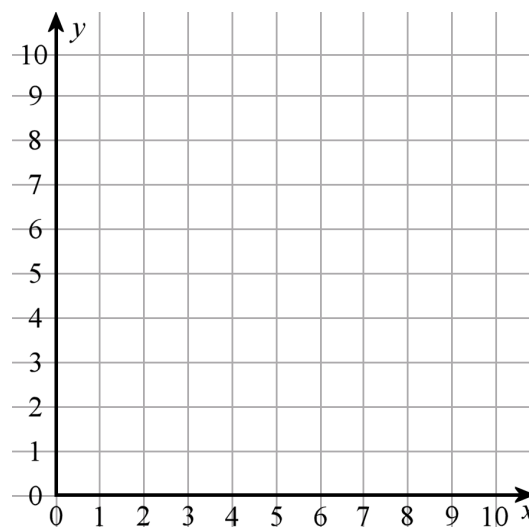
6. Draw these figures using a compass and a ruler only in your notebook. The copies you draw do not have to be the same exact size as here; they just need to show the same pattern. *See hints at the bottom of this page. Optionally, you can also draw these in drawing software.*

a.

b.

c.

d.
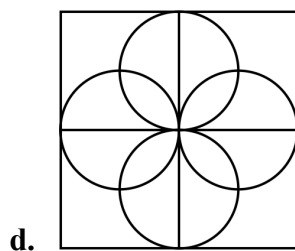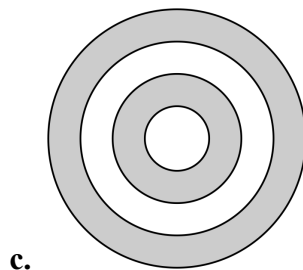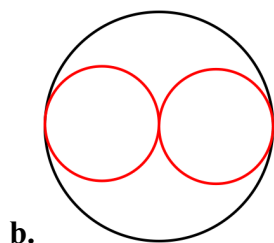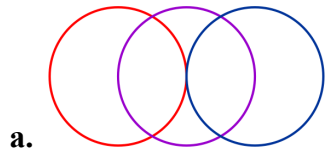
See **http://homeschoolmath.blogspot.com/2013/02/geometric-art-project-seven-circle.html** for one more circle design / art project!

a. Hint: Draw a line. Then, draw the three center points on it, equally spaced.

b. Hint: First, draw the three center points for the three circles, equally spaced.
   What is the radius of the big circle compared to the radius of the small ones?

c. Hint: What pattern is there in the radii of these circles? These circles are called concentric circles because they share the same center point.

d. Hint: You need to draw the outer square first. Then measure and divide it into quarters. Measure to draw the center points of the circles (they are midpoints of the sides of the smaller squares).

New terms to remember:

- circle
- circumference
- radius
- diameter

Math Mammoth Geometry 1 (Blue Series)